



## RD Differential pressure switches

Pneumatics or hydraulic fluid control

Power generation safety equipments

Pressurized chambers control

Level measurement

Conforms to CE (Low voltage Directive N° 73/23/EEC modified by N° 93/68/EEC)

These instruments compare a pre-established adjustable set point to the received process pressure.

Equipped with one or two snap action microswitches, they are used for controlling the process cycles, or operate an alarm when pressure reaches set point value.

Depending on options selected, adjustable differential deadband is available. Featuring possibility to adjust change on rise and change on fall limits or enabling to get rid of undesired repetitive on/off around set point.



### Technical Data (20°C)

Black Zamac enclosure and blue cover protected

IP 65 rating to NF EN 60529 standard.

Captive fixing screws for cover attachment.

Wall mounting by removable bracket.

External adjustment screws fitted with an antivibration system, locking the set point and the deadband, protected by screwed and sealable caps.

Internal mechanism in bichromate treated galvanized steel.

Electrical connection wired to internal terminal block with N°11 cable gland for cable measuring between 7 and 10,5 mm in diameter.

Internal earth connection.

Pressure connections : G 1/2 or female 1/4 NPT.

Technical specifications

Storage temperature: - 40...+ 70°C

Reproducibility  $\pm 1\%$  of range for microswitch E (GS);  $\pm 2\%$  (other microswitches).

Tests and certification

Explosion-proof version EEx d II C T6, certificate N° L.C.I.E. 81 60 57- 03.

Intrinsically safe version EEx ia IIC T6, certificate N° L.C.I.E. 88 B 6081 X. This version must be used only with an intrinsically safe electrical installation.

Explosion-proof and intrinsically safe versions valid until 30 June 2003.

New ATEX/94/CE certification (in progress).

#### Important

All pulsating circuits must be fitted with pulsation dampeners. When mechanical vibrations are present, these should be reduced as much as possible by installing the pressure switches on antivibration mounts. For the switch to be correctly calibrated, the operating static pressure must be known. Normal operation is between 10 % and 90 % of the selected scale. Deadband values given in the table (see overleaf) are defined under these conditions.



## Operating ranges

### RDDP - RDPN - RDPH - RDHN low pressure (ZDP1)

**RDDP :** standard sensing element with treated steel flanges and diaphragm according to (1) or (2).

**RDPN :** standard sensing element with 1.4404 (316L) stainless steel flange and Viton diaphragm.

SCALE	Code	Maxi $\Delta P$	static P Maxi	MICROSWITCH								DIMENSIONS
				Adjustable deadband				Fixed deadband		Fixed deadband		
				A (SI)		C (SH)		E (GS)		D (GSH)		
At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale					
mbar		mbar	bar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	
-2.5 to +2.5	110	5	0.15					0.3	0.4			
2 to 10	111 <sup>(1)</sup>	10	0.15	1.2 to 10	1.6 to 10	4.5 to 10	4.5 to 10	0.3	0.4	1.5	2	Fig. 1
2 to 50	121 <sup>(1)</sup>	50	0.15	1.7 to 30	2.2 to 30	5 to 30	5.5 to 30	0.4	0.5	2	3	Fig. 1
2 to 100	131 <sup>(1)</sup>	100	0.15	1.7 to 40	2.5 to 40	5.5 to 40	10 to 40	0.5	0.7	2	3	Fig. 1
10 to 200	156 <sup>(2)</sup>	200	1	8 to 80	10.5 to 80	25 to 80	40 to 80	2.5	3.4	10	13	Fig. 2
10 to 400	157 <sup>(2)</sup>	400	1	15 to 150	20 to 150	30 to 150	45 to 150	4.5	6	18	24	Fig. 2

- (1) Viton diaphragm  
(2) EPDM diaphragm

**RDPH :** sensing element with standing overpressures with treated steel flanges and diaphragm according to (1), (2), (3).

**RDHN :** sensing element with standing overpressure with 1.4404 (316L) stainless steel flanges and diaphragm according to (1), (3).

SCALE	Code	Maxi $\Delta P$	static P Maxi	MICROSWITCH								DIMENSIONS
				Adjustable deadband				Fixed deadband		Fixed deadband		
				(SI)		(SH)		(GS)		(GSH)		
At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale					
mbar		mbar	bar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	
2 to 10	111 <sup>(1)</sup>	10	0 to 5	1.2 to 10	1.6 to 10	4.5 to 10	4.5 to 10	0.3	0.4	1.5	2	Fig. 3
2 to 20	112 <sup>(1)</sup>	50	0 to 5	1.7 to 20	2.2 to 20	5 to 20	5.5 to 20	0.4	0.5	2	3	Fig. 3
2 to 50	121 <sup>(1)</sup>	50	0 to 5	1.7 to 30	2.2 to 30	5 to 30	5.5 to 30	0.4	0.5	2	3	Fig. 3
2 to 100	131 <sup>(1)</sup>	100	0 to 5	1.7 to 40	2.5 to 40	5.5 to 40	10 to 40	0.5	0.7	2	3	Fig. 3
10 to 200	156 <sup>(1)</sup>	200	5.5 to 50	8 to 80	10.5 to 80	35 to 80	45 to 80	2.5	3.4	10	13	Fig. 4
10 to 400	157 <sup>(1)</sup>	400	5.5 to 50	15 to 150	20 to 150	40 to 150	50 to 150	4.5	6	18	24	Fig. 4
10 to 1000	158 <sup>(1)</sup>	1000	5.5 to 50	18 to 150	22 to 150	45 to 150	60 to 150	5	7	22	26.5	Fig. 4
10 to 700	161 <sup>(1)(2)</sup>	700	5.5 to 80	20 to 200	30 to 200	60 to 350	90 to 350	6	8	24	36	Fig. 5
10 to 1500	162 <sup>(1)(2)</sup>	1500	5.5 to 80	20 to 300	30 to 300	60 to 350	100 to 350	6	8	24	36	Fig. 5
10 to 2000	163 <sup>(1)(2)</sup>	2000	5.5 to 80	30 to 300	60 to 300	90 to 350	200 to 350	9	12	36	72	Fig. 5

- (1) Viton diaphragm  
(2) EPDM diaphragm - G 1/4 female connection  
(3) Nitrile, Butyl rubber diaphragm

T° fluid : -15...+150° C  
T° ambient : -10...+55° C

} RDDP/RDPN  
RDPH/RDHN

These microswitches can be implemented with two simultaneous contacts :  
SII (2 x SI), GSS (2 x GS), SHH (2 x SH), GSHH (2 x GSH)  
Warning : in this case, deadbands are multiplied by 1.5  
Explosion-proof model : deadbands are multiplied by 1.5  
SAM version : consult us.



## Operating ranges

### RDPW - RDWN low pressure (ZDP1), RDDP - RDPN medium pressure (ZDP2)

**RDPW :** standard sensing element, treated steel flanges, EPDM diaphragm not perturbed by static pressure variations.

**RDWN :** standard sensing element, 1.4404 (316L) stainless steel flanges and Viton diaphragm, not perturbed by static pressure variations.

SCALE	Code	Maxi $\Delta P$	Static P Maxi	MICROSWITCH								DIMENSIONS
				Adjustable deadband				Fixed deadband		Fixed deadband		
				(SI)		(SH)		(GS)		(GSH)		
At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale					
mbar		mbar	bar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	mbar	
10 to 200	156	200	20	8 to 80	10.5 to 80	35 to 80	45 to 80	2.5	3.4	10	13	Fig. 6
10 to 400	157	400	20	15 to 150	20 to 150	40 to 150	50 to 150	4.5	6	18	24	Fig. 6
10 to 1000	158	1000	20	18 to 150	22 to 150	45 to 150	60 to 150	5	7	22	26.5	Fig. 6
10 to 700	161*	700	20	30 to 250	45 to 250	130 to 450	150 to 450	13	15	36	54	Fig. 7
10 to 1500	162*	1500	20	30 to 300	45 to 300	130 to 450	150 to 450	13	15	36	54	Fig. 7
10 to 2000	163*	2000	20	45 to 300	90 to 300	180 to 450	300 to 450	18	25	54	108	Fig. 7

T° fluid : -15...+150° C  
T° ambient : -10...+55° C

\* G 1/4 : female connection

**RDDP :** standard sensing element with brass base plate, Tombac bellow or nickel-plated piston.

**RDPN :** standard sensing element with stainless steel base plate, stainless steel bellow or nickel plated piston.

SCALE	Code	Maxi $\Delta P$	static P Maxi	MICROSWITCH								DIMENSIONS
				Adjustable deadband				Fixed deadband		Fixed deadband		
				(SI)		(SH)		(GS)		(GSH)		
At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale	At 10 % of scale	At 90 % of scale					
bar		bar	bar	bar	bar	bar	bar	mbar	mbar	bar	bar	
0.05 to 0.5	211	0.5	7	0.09 to 0.3	0.1 to 0.3	0.15 to 0.4	0.2 to 0.4	25	30	0.11	0.12	Fig. 1
0.05 to 1	221	1	7	0.09 to 0.3	0.1 to 0.3	0.15 to 0.4	0.22 to 0.4	25	30	0.11	0.12	Fig. 1
0.15 to 0.5	214*	0.5	15	0.14 to 0.5	0.18 to 0.5	-	-	55	60	0.17	0.22	Fig. 2
0.15 to 1	224*	1	15	0.14 to 0.6	0.20 to 0.6	-	-	55	60	0.17	0.24	Fig. 2
0.15 to 4	234*	4	15	0.14 to 1.5	0.25 to 1.5	0.65 to 2	0.8 to 2	55	65	0.17	0.3	Fig. 2
0.8 to 4	235	4	30	0.7 to 2.5	1.1 to 2.5	0.75 to 2.5	1.1 to 2.5	70	100	0.84	1.35	Fig. 2
0.8 to 10	245	10	30	0.7 to 2.5	1.1 to 2.5	0.75 to 2.5	1.1 to 2.5	70	100	0.84	1.35	Fig. 2
1.5 to 10	246	10	65	1.2 to 5	2.5 to 5	2.5 to 6	3.5 to 6	180	240	1.45	3	Fig. 2
1.5 to 20	256	20	65	1.2 to 5	2.5 to 5	2.5 to 6	3.5 to 6	180	240	1.45	3	Fig. 2
2.5 to 20	257**	20	220	2.5 to 20	3.5 to 20	6 to 20	7 to 20	800	1000	3	4.2	Fig. 2
2.5 to 30	258**	30	220	3 to 20	4 to 20	6 to 20	7 to 20	850	1000	3.6	4.8	Fig. 2
15 to 120	651	120	600	15 to 100	25 to 100	25 to 100	35 to 100	12 bar	15 bar	18	30	Fig. 2

\* Static P maxi = 30 bar for stainless steel version  
\*\* measuring element in stainless steel only

T° fluid : -50...+80° C (RDDP)  
-50...+200° C (RDPN)  
T° ambient : -25...+55° C (all versions)

These microswitches can be implemented with two simultaneous contacts :

SII (2 x SI), GSS (2 x GS), SHH (2 x SH), GSHH (2 x GSH)

Warning : in this case, deadbands are multiplied by 1.5

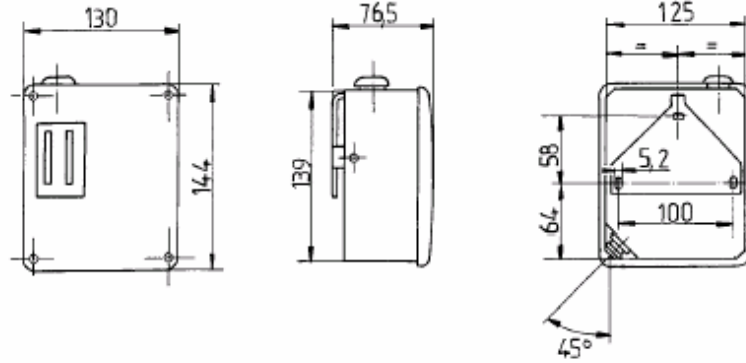
Explosion-proof model : deadbands are multiplied by 1.5

SAM version : consult us.

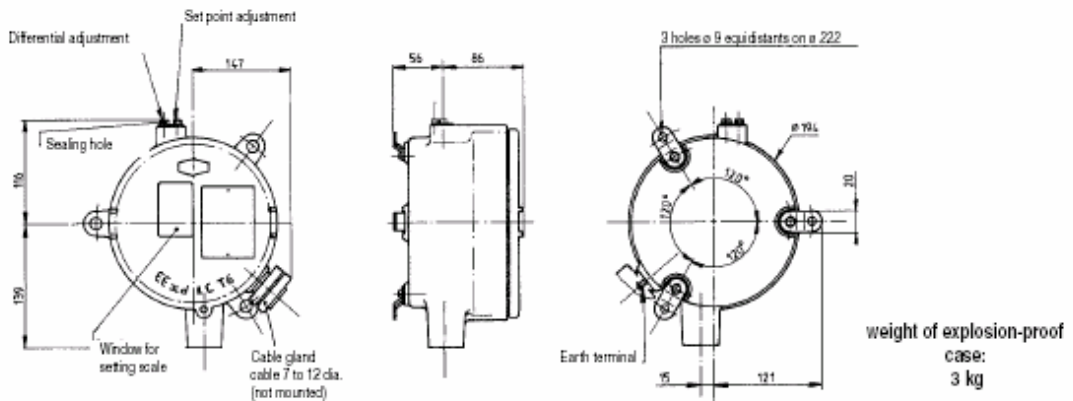


**Dimensions (mm)**

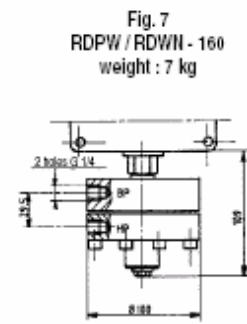
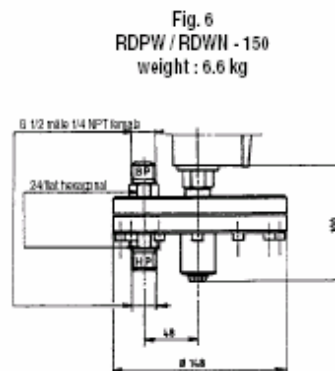
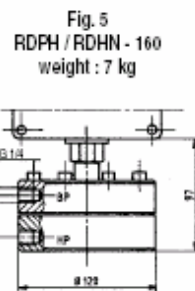
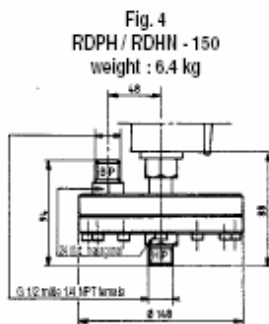
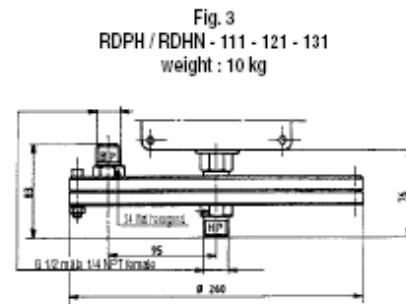
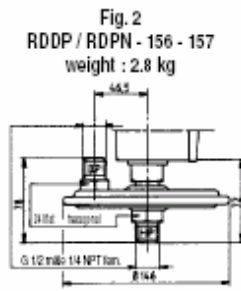
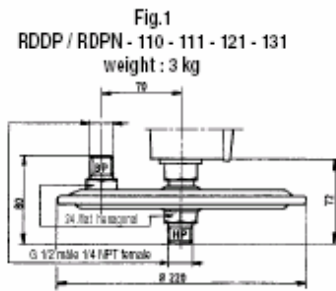
**Watertight case**



**Explosion-proof case**



**Sensing element RDDP / RDPN / RDPH / RDHN / RDPW / RDWN low pressure range (ZDP1)**



## Dimensions (mm)

### RDDP / RDPN medium pressure range

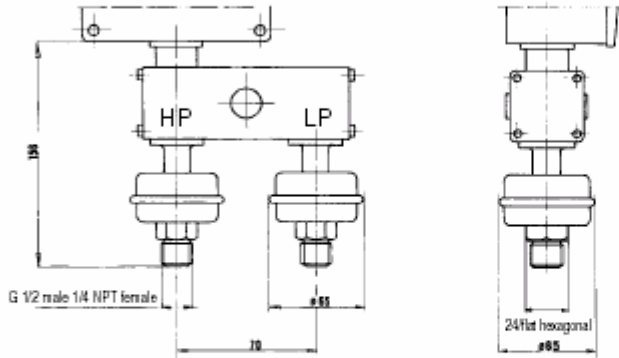


Fig. 1  
RDDP / RDPN 211 - 221  
weight : 3 kg

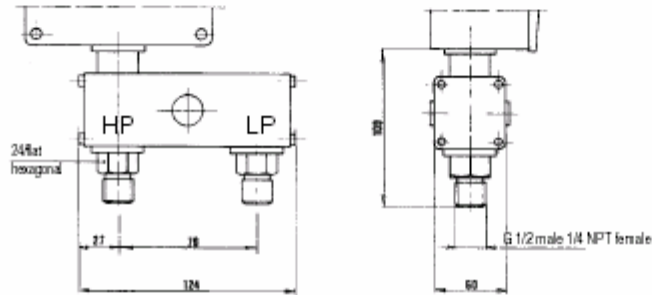
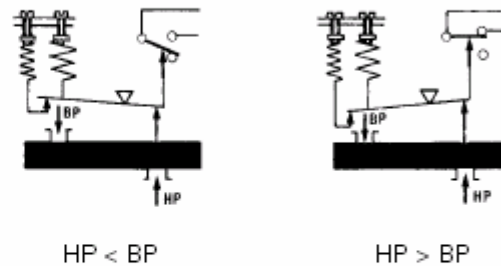


Fig. 2  
RDDP / RDPN 214 - 224 - 234 - 235 - 245 -  
246 - 256 - 257 - 258 - 651  
weight : 3 kg

## Operating principle

An element which is sensitive to a differential pressure actuates one or two microswitches via levers. The set point and the deadband are adjusted by springs.



## Accessories

Adaptor for welded connection :  
in steel ZRM1 or stainless steel ZRMN1

Steel or s.s. 1.4401 (AISI 316) siphon

Chemical seal (see our technical documentation)

Robinet d'isolement.

Manifold.

Amortisseur de pulsation.



## Options

### Uncoded options (have to be listed after the code number)

Tropicalization (switches SI and SII only). Micro N  
 Gold contact (switches SI and SII only). Micro M  
 Blow out disc  
 Socket connector  
 Knurled knob for adjustment of the set point (ZB2)  
 Knurled knob for adjustment of the deadband (ZB3)  
 MARINE version

All stainless steel construction (screws and sensor) for aggressive environments  
 Pneumatic version  
 Electronuclear model (consult us)  
 Specific connection  
 Cleanliness for oxygen service

## Ordering Details - RD

Model		1 <sup>st</sup> digit		RDxx xxx xxx	
Pressure switch		R			
Type		2 <sup>nd</sup> ...4 <sup>th</sup> digit			
ZDP1					
ZDP		DDP			
ZDPH		DPH			
ZDPW		DPW			
ZDPN		DPN			
ZDPHN		DHN			
ZDPWN		DWN			
ZDP2					
ZDP		DDP			
ZDPN		DPN			
Microswitch **		5 <sup>th</sup> digit			
Current rating (resistive circuits)		AC	DC		
SI	1 standard changeover switch (1xSPDT)	5A/250Vac	0.5A/110Vcc	A	
SII	2 simultaneous changeover switches (2xSPDT)	2 x 5A/250Vac	2x0.5A/110Vcc	B	
SH	1 hermetically sealed changeover switch (1xSPDT)	2.5A/250Vac	1A/110Vcc	C	
GSH	1 herm. sealed ultra sensitive changeover switch (1xSPDT)	1A/250Vac	2A/30Vcc	D	
GSHH	2 herm. sealed ultra sensiti. changeover switches (2xSPDT)	2 x 1A/250Vac	2x2A/30Vcc	V	
GS	1 ultra sensitive changeover switches (1xSPDT)	2 A/250Vac	1A/30Vcc	E	
GSS	2 ultra sensitive changeover switches (2xSPDT)	2 x 2A/250Vac	2x1A/30Vcc	F	
SAM	2 movable changeover switches	2 x 2A/250Vac	2x1A/30Vcc	G	
SHH	2 hermetically changeover switches (2xSPDT)	2 x 2.5A/250Vac	2x1A/110Vcc	W	
*SRC	1 changeover switch with manual reset opening on rise	5A/250Vac	5A/30Vcc	H	
*SRF	1 changeover switch with manual reset opening on fall	5A/250Vac	5A/30Vcc	J	
Protection		6 <sup>th</sup> digit			
Standard				A	
Explosion proof				E	
IS - Intrinsically safe				Y	
Hydraulic connection		7 <sup>th</sup> digit			
G 1/4 female (171, 172, 173 only)				2	
G 1/2				3	
1/2 NPT male				6	
1/4 NPT female				8	
Pressure range		8 <sup>th</sup> ...10 <sup>th</sup> digit			
See codes in table				xxx	

ZDP1	Measurement range bar	RDDP RDPN	RDPH RDHN	RDPW RDWN
110	-2.5 + 2.5	X		
111	2 + 10	X	X	
112	2 + 20		X	
121	2 + 50	X	X	
131	2 + 100	X	X	
156	10 + 200	X	X	X
157	10 + 400	X	X	X
158	10 + 1000		X	X
161	10 + 700		X	X
162	10 + 1500		X	X
163	10 + 2000		X	X

ZDP2	Measurement range bar	RDDP RDPN
211	0.05 + 0.5	X
221	0.05 + 1	X
214	0.15 + 0.5	X
224	0.15 + 1	X
234	0.15 + 4	X
235	0.8 + 4	X
245	0.8 + 10	X
246	1.5 + 10	X
256	1.5 + 20	X
257	2.5 + 20	X
258	2.5 + 30	X
651	15 + 120	X

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\* Not possible in Explosion Proof version.

\*\* SPDT microswitches only

Electronuclear versions : ZDPN-M, ZDPHN-M, ZDPWN-M

Order under the following commercial references : ZDPN-M code = (SHM or CHM)